Smart Wireless Gateway

- *Gateway connects wireless self-organizing networks with any host system*

- *Easy configuration and management of self-organizing networks*

- *Easy integration into control systems and data applications through serial and Ethernet connections*

- *Seamless integration into AMS® Device Manager and DeltaV™ automation system*

- *Greater than 99% reliability with industry proven security*

- *Smart Wireless capabilities extends the full benefit of PlantWeb® architecture to previously inaccessible locations*

IEC

WirelessHART®

Contents

EMERSON
Process Management

Smart Wireless Gateway

Flexible Connectivity Options and Easy Device Configuration

Host Integration with DeltaV™ and Ovation®

- Gain real-time information on process and assets with intuitive operator interface
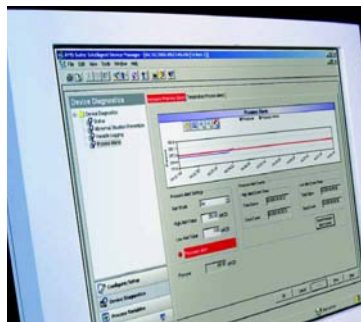- Native interface between control system and gateway

Flexible Integration

- Smart Wireless Gateway connects legacy hosts, Serial Modbus®, and Ethernet or OPC output

Complete Asset Management with AMS Device Manager

- Manage predictive diagnostics from wired and wireless field devices to identify problems before the process is affected
- Streamline wireless device configuration through Smart Wireless Gateway

Other Interfaces

- Web interface and AMS Wireless Configurator are standard with every gateway for set-up and initial configuration of wireless devices
- Data historian connectivity for documentation and compliance information

Device Specifications

- Update rate: User Selectable 4, 8, 16, 32 second or 1 to 60 minutes
- Network Size: Up to 100 devices
- Output: Ethernet, Modbus, OPC, Serial, HART-IP
- Approvals: FM, CSA, ATEX, IECEx

IEC

Wireless HART®

IEC 62591 (*Wireless*HART™)... The Industry Standard

Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, network automatically finds the best communication paths
- Network continuously monitors paths for degradation and repairs itself
- Adaptive behavior provides reliable, hands-off operation and simplifies network deployments, expansion, and reconfiguration
- Supports both star and mesh topologies

**Industry Standard Radio with Channel Hopping**

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels
- Time Synchronized Channel Hopping to avoid interference and increase reliability
- Direct sequence spread spectrum (DSSS) technology delivers high reliability in challenging radio environment

Self-Healing Network

- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, data will continue to flow because the device already has other established paths. The network will then lay in more communication paths as needed for that device.

Seamless Integration to Existing Hosts

- Transparent and seamless integration
- Same control system applications
- Gateways connect using industry standard protocols
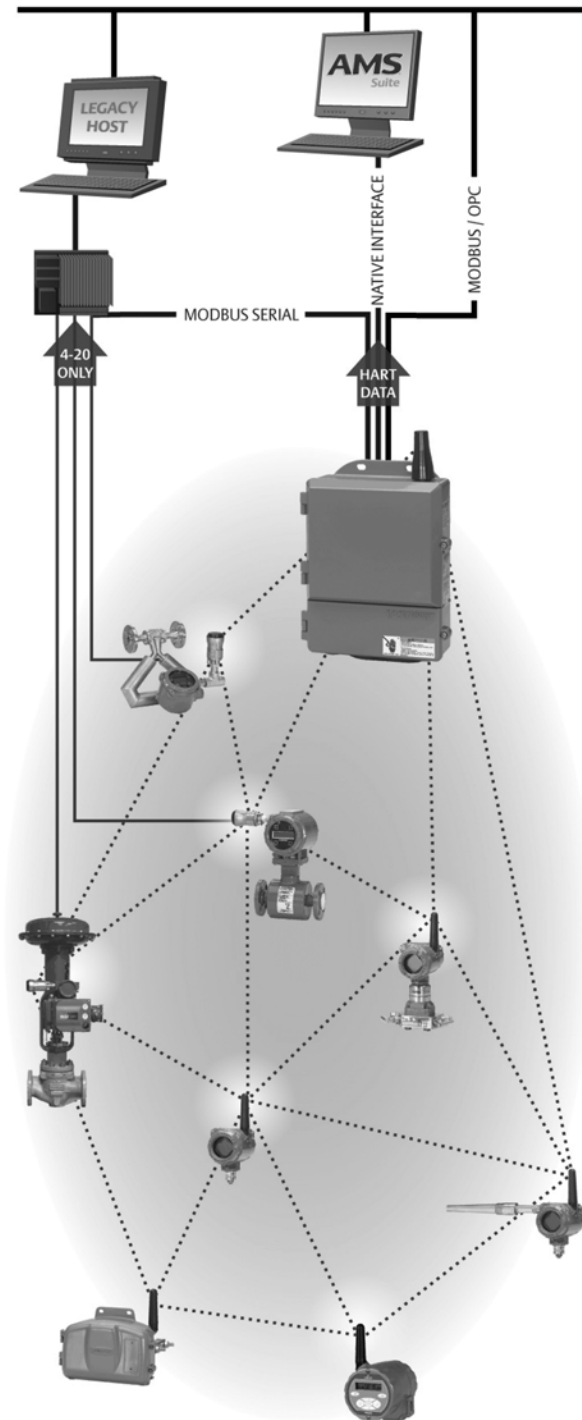
Ordering Information

Table 1. 1420 Smart Wireless Gateway Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
  The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
1420	Smart Wireless Gateway	
Power Input		
Standard		**Standard**
A	24 Vdc	★
Ethernet Communications - Physical Connection		
Standard		**Standard**
1[1][2]	Ethernet	★
2[3][4]	Dual Ethernet	★
Expanded		
3[5][6]	Fiber Optic Ethernet	
Wireless Update Rate, Operating Frequency, and Protocol		
Standard		**Standard**
A3	User Configurable Update Rate, 2.4 GHz DSSS, WirelessHART	★
Serial Communication		
Standard		**Standard**
N	None	★
A[7]	Modbus RTU via RS485	★
Ethernet Communication - Data Protocols		
Standard		**Standard**
2	Webserver, Modbus TCP/IP, AMS Ready	★
4	Webserver, Modbus TCP/IP, AMS Ready, OPC	★
5[8]	DeltaV Ready	★
6[8]	Ovation Ready	★
7[9]	HART-IP	★

Options (Include with selected model number)

Product Certifications		
Standard		**Standard**
N5	FM Division 2, Non-incendive	★
N6	CSA Division 2,Non-incendive	★
N1	ATEX Type n	★
ND	ATEX Dust	★
N7	IECEx Type n	★
NF	IECEx Dust	★
KD	FM & CSA Division 2, Non-incendive and ATEX Type n	★
N3	China Type n	★
N4	TIIS Type n	★
Adapters		
Standard		**Standard**
J1	CM 20 Conduit Adapters	★
J2	PG 13.5 Conduit Adapters	★
J3	$^3/_4$ NPT Conduit Adapters	★
Antenna Options[10]		
Standard		**Standard**
WL2	Remote Omni-Antenna Kit, 50 ft. (15.2 m) cable, Lightning Arrestor	★
WL3	Remote Omni-Antenna Kit, 20 ft. (6.1 m) and 30 ft. (9.1 m) cables, Lightning Arrestor	★
WL4	Remote Omni-antenna Kit, 10 ft. (3.0 m) and 40 ft. (12.2 m) cables, Lightning Arrestor	★
Typical Model Number: 1420 A 2 A3 A 2 N5		

(1)   Single active 10/100 baseT Ethernet port with RJ45 connector.

(2)   Additional ports disabled.

(3)   Dual active 10/100 baseT Ethernet ports with RJ45 connectors.

(4)   Multiple active ports have separate IP addresses, firewall isolation, and no packet forwarding.

(5)   1300 nm Multimode Optical fiber connection with separate SC connectors for Rx and Tx.

(6)   Includes features of Option 1.

(7)   Convertible to RS232 via adaptor, not included with Gateway.

(8)   Includes Webserver, Modbus TCP, AMS Ready, and OPC.

(9)   Includes Webserver, Modbus TCP, and AMS Ready.

(10) The WL2 - WL4 options require minor assembly.

ACCESSORIES AND SPARE PARTS

Table 2. Accessories

Item Description	Part Number
AMS® Wireless SNAP-ON™, 1 Gateway License	01420-1644-0001
AMS Wireless SNAP-ON, 5 Gateway Licenses	01420-1644-0002
AMS Wireless SNAP-ON, 10 Gateway Licenses	01420-1644-0003
AMS Wireless SNAP-ON, 5-10 Upgrade Licenses	01420-1644-0004
Serial Port HART Modem and Cables only	03095-5105-0001
USB Port HART Modem and Cables only	03095-5105-0002

Table 3. Spare Parts

Item Description	Part Number
Spare Kit, WL2 Replacement[1], Remote Antenna, 50 ft. (15,2 m) Cable, and Lightning Arrestor	01420-1615-0302
Spare Kit, WL3 Replacement[1], Remote Antenna, 20/30 ft. (6,1/9,1 m) Cables, and Lightning Arrestor	01420-1615-0303
Spare Kit, WL4 Replacement[1], Remote Antenna, 10/40 ft. (3,0/12,2 m) Cables, and Lightning Arrestor	01420-1615-0304

(1)   Can not upgrade from integral to remote antenna.

Smart Wireless Gateway

Specifications

Functional Specifications

Input Power
19.2 - 28.8 Vdc
250 mA startup
150 mA continuous

Radio Frequency Power Output from Antenna
Maximum of 10 mW (10 dBm) EIRP

Environmental
Operating Temperature Range:
-40 to 158 °F (-40 to 70 °C)
Operating Humidity Range:
10-90% relative humidity

EMC Performance
Complies with EN61326-1:2006.

Antenna Options
Integrated Omnidirectional Antenna
Optional remote mount Omnidirectional Antenna

Physical Specifications

Weight
10 lb (4.54 kg)

Material of Construction
Housing
Low-copper aluminum, NEMA 4X
Paint
Polyurethane
Cover Gasket
Silicone Rubber
Antenna
PBT/PC integrated Omnidirectional Antenna

Certifications
Class I Division 2 (U.S.)
Equivalent Worldwide

Communication Specifications

Isolated RS485
2-wire communication link for Modbus RTU multidrop connections
Baud rate: 57600, 38400, 19200, or 9600
Protocol: Modbus RTU
Wiring: Single twisted shielded pair, 18 AWG. Wiring distance up to 4,000 ft. (1,524 m)

Ethernet
10/100base-TX Ethernet communication port
Protocols: Modbus TCP, OPC, HART-IP, https (for Web Interface)
Wiring: Cat5E shielded cable. Wiring distance 328 ft. (100 m).

Fiber Optic Ethernet (optional)
100BaseFx optical Ethernet communication port
Wavelength: 1300 nm center
Multimode
SC connectors
Protocols: Modbus, TCP, OPC, HART-IP, https (for Web Interface)
Wiring: 50/125 um or 62.5/125 um fiber, 2.48 miles (4.0 k,) maximum distance.

Modbus
Supports Modbus RTU and Modbus TCP with 32-bit floating point values, integers, and scaled integers.
Modbus Registers are user-specified.

OPC
OPC server supports OPC DA v2, v3

Self-Organizing Network Specifications

Protocol
IEC 62591 (*Wireless*HART), 2.4 - 2.5 GHz DSSS.

Maximum Network Size
100 wireless devices @ 8 sec.
50 wireless devices @ 4 sec.

Supported Device Update Rates
4 sec. to 60 min.

Network Size/Latency
100 Devices: less than 10 sec.
50 Devices: less than 5 sec.

Data Reliability
>99%

System Security Specifications

Ethernet
Secure Sockets Layer (SSL)- enabled (default) TCP/IP communications

Smart Wireless Gateway Access
Role-based Access Control (RBAC) including Administrator, Maintenance, Operator, and Executive. Administrator has complete control of the gateway and connections to host systems and the self-organizing network.

Self-Organizing Network
AES-128 Encrypted WirelessHART, including individual session keys. Drag and Drop device provisioning, including unique join keys and white listing.

Internal Firewall
User Configurable TCP ports for communications protocols, including Enable/Disable and user specified port numbers. Inspects both incoming and outgoing packets.

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. – Chanhassen, Minnesota, USA
Emerson Process Management GmbH & Co. - Karlstein, Germany
Emerson Process Management Asia Pacific Private Limited - Singapore
Beijing Rosemount Far East Instrument Co., Limited - Beijing, China

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions. This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification for FM

As standard, the Gateway has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North American Certifications

N5   FM Division 2, Non-Incendive
Certificate Number: 3028321

Nonincendive for Class I, Division 2, Groups A, B, C, and D.
Suitable for Class II, III, Division 1,
Groups E, F, and G; Indoors/outdoor locations;
Type 4X
Temperature Code: T4 (-40 °C < T_a < 60 °C)

Canadian Standards Association (CSA)

N6   CSA Division 2, Non-Incendive
Certificate Number: 1849337
Suitable for Class I, Division 2, Groups A, B, C, and D.
Dust Ignition-proof for Class II, Groups E, F, and G;
Suitable for Class III Hazardous Locations.;
Install per Rosemount drawing 01420-1011.
Temperature Code: T4 (-40 °C < T_a < 60 °C)
CSA Enclosure Type 4X

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting your local sales representative.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

Electro Magnetic Compatibility (EMC) (2004/108/EC)

Emerson Process Management complies with the EMC Directive.

Radio and Telecommunications Terminal Equipment Directive (R&TTE)(1999/5/EC)

Emerson Process Management complies with the R&TTE Directive

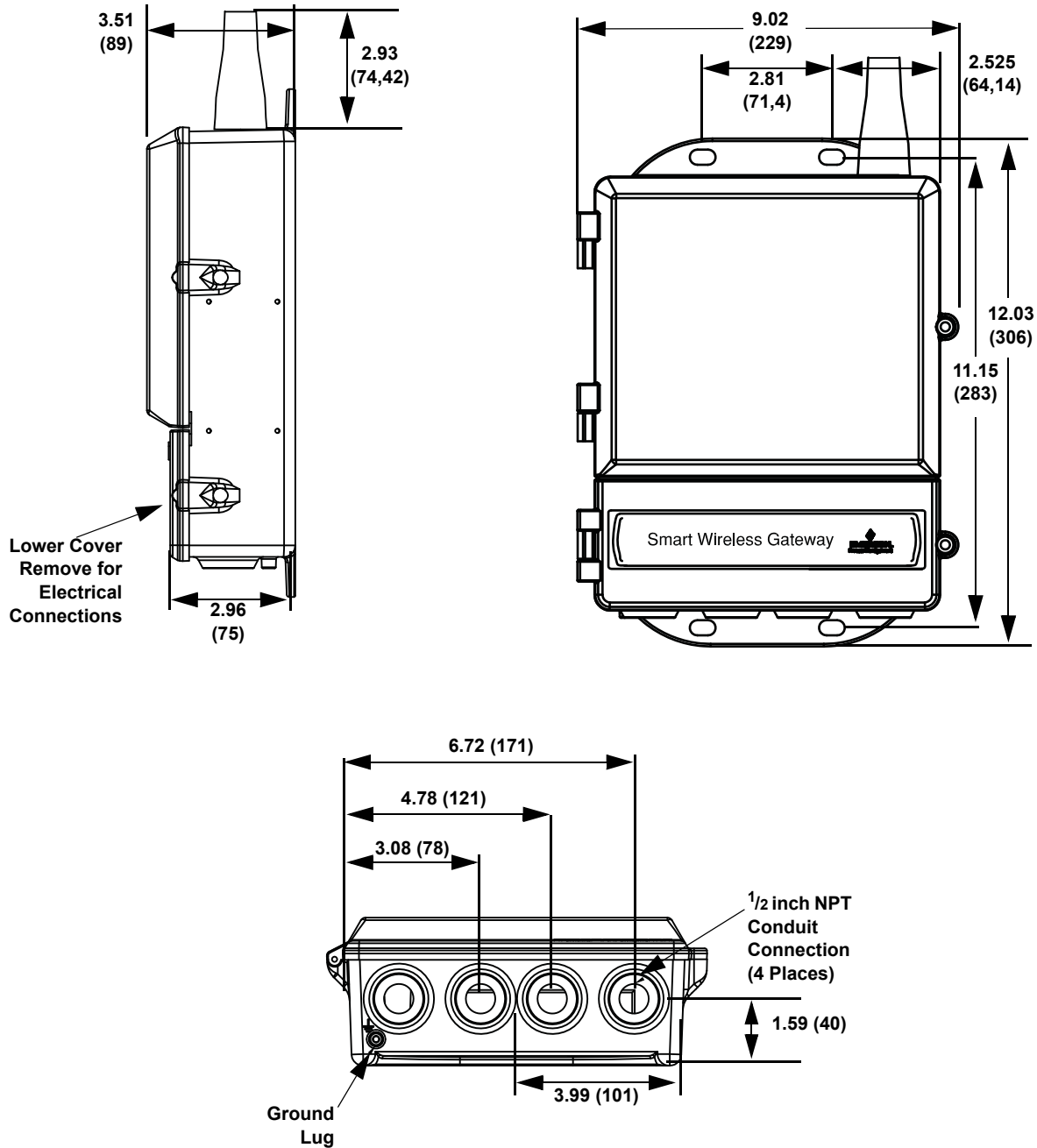$C\!\epsilon$

European Certification

N1   ATEX Type n
Certificate Number: Baseefa 07ATEX0056X
ATEX Marking: ⟨Ex⟩ II 3 G
Ex nA nL IIC T4 (-40 °C < T_a < 60 °C)

Special condition for safe use (X):

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

The Apparatus is not capable of withstanding the 500V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

ND A   TEX Dust
Certificate Number: Baseefa 07ATEX0057
ATEX Marking: ⟨Ex⟩ II 3 G
Ex tD A 22 IP66 T135 (-40 °C < T_a < 60 °C)
Maximum working Voltage = 28 V

N7   IECEx Type n
Certificate Number: IECEx BAS 07.0012X
Ex nA nL IIC T4 (-40 °C =< T_a <=60 °C)
Maximum working voltage = 28 V

Special condition for safe use (X):

The surface resistivity of the antenna is greater than one gigaohm. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

The Apparatus is not capable of withstanding the 500 V insulation test required by Clause 9.4 of EN 60079-15: 2005. This must be taken into account when installing the apparatus.

NF   IECEx Dust
Certification Number: IECEx BAS 07.0013
Ex tD A22 IP66 T135 (-40 °C < T_a < 60 °C)
Maximum working voltage = 28 V

Combinations of Certifications

KD Combination of N5, N6, and N1.

Dimensional Drawings

Figure 1. Smart Wireless Gateway
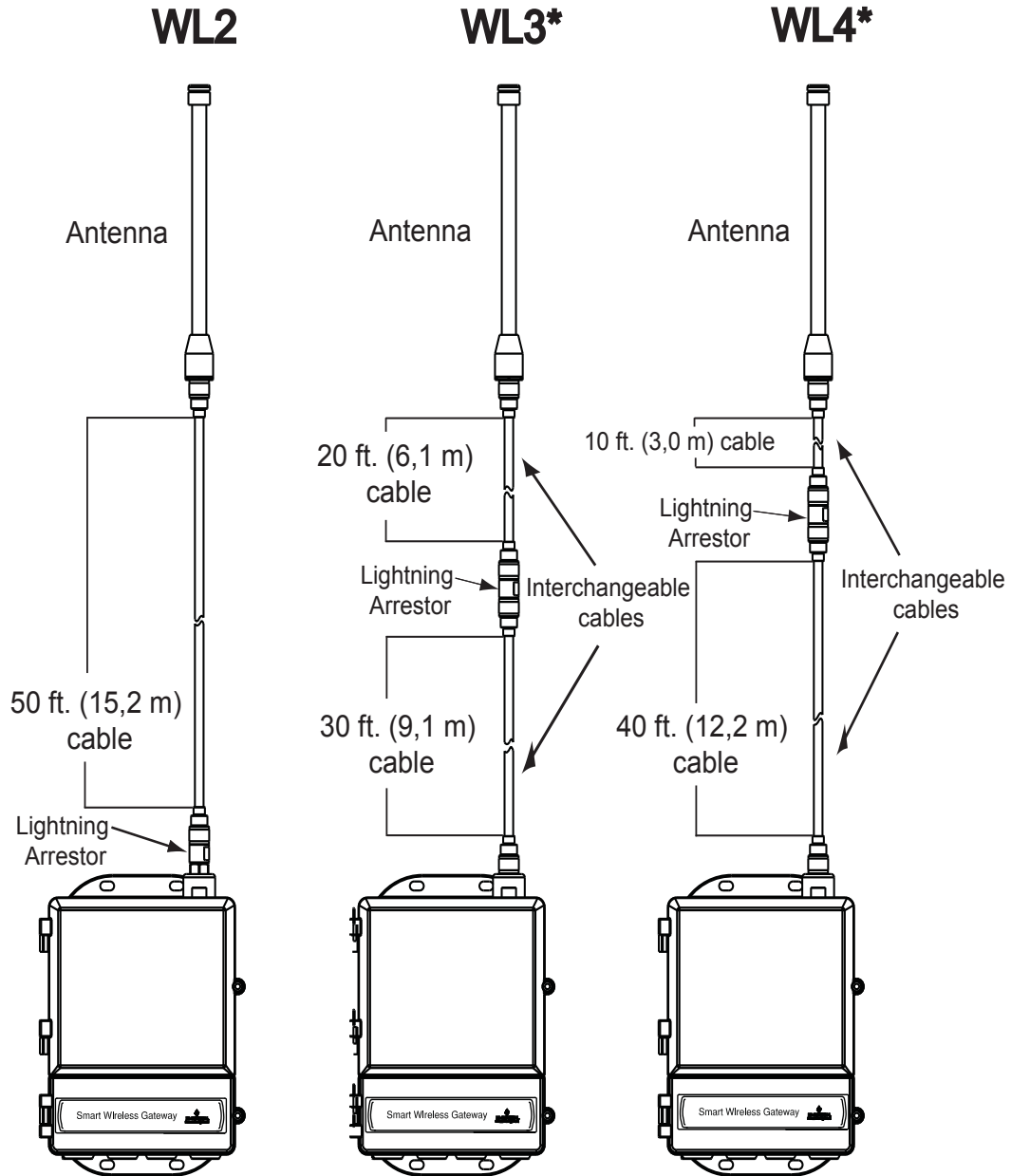(Dimensions are in inches (millimeters)

3.51
(89)

2.93
(74,42)

Lower Cover
Remove for
Electrical
Connections

2.96
(75)

9.02
(229)

2.81
(71,4)

2.525
(64,14)

12.03
(306)

11.15
(283)

Smart Wireless Gateway

6.72 (171)

4.78 (121)

3.08 (78)

¹/₂ inch NPT
Conduit
Connection
(4 Places)

1.59 (40)

3.99 (101)

Ground
Lug

Remote Omni-Antenna Kit

WL2　　WL3*　　WL4*

Antenna　　　Antenna　　　Antenna

20 ft. (6,1 m) cable

10 ft. (3,0 m) cable

Lightning Arrestor

Interchangeable cables

Lightning Arrestor

Interchangeable cables

50 ft. (15,2 m) cable

30 ft. (9,1 m) cable

40 ft. (12,2 m) cable

Lightning Arrestor

Smart Wireless Gateway　　Smart Wireless Gateway　　Smart Wireless Gateway

The Remote Omni-Antenna kit includes sealant tape for remote antenna connection, as well as mounting brackets for the antenna, Lightning Arrestor, and the Smart Wireless Gateway.

Lightning protection is included on all the options. WL3 and WL4 provide lightning protection along with the ability to have the gateway mounted indoors, the antenna mounted outdoors, and the lightning arrestor mounted at the building egress.

*Note that the coaxial cables on the remote antenna options WL3 and WL4 are interchangeable for installation convenience.

EMERSON™
Process Management